

CA H2 NET Straw Man Proposal

Merriam-Webster's definition of "straw-man"

A "straw-man proposal" is a simple draft proposal intended to generate discussion of its disadvantages and to provoke the generation of new, better, proposals. As the document is revised, it may be given other edition names such as "iron-man", etc.

Core Values Driving Hydrogen Blueprint Plan

- **Energy independence**
- **Energy security & diversity**
- **Reducing air pollution**
- **Reducing global warming emissions**
- **Protecting public health**
- **Economic competitiveness**
- **Job creation**

A Bold Vision

Governor Schwarzenegger's Executive Order sets forth a bold vision for the California Hydrogen Highway Network. It will take time for hydrogen to capture a major fraction of transportation markets. We have a unique opportunity to make progress over the next five years through a series of coordinated actions that could open the way for large-scale hydrogen use in the future. Further, California has the chance to establish its leadership in the emerging hydrogen, fuel cell and clean energy industries. If by 2010, California is blazing a trail along the critical path toward large scale use of hydrogen, and commercialization of hydrogen technologies, the California Hydrogen Highway Network will be a success.

Goals for 2010.

About a dozen hydrogen refueling stations are already operating in California, with more planned. An important goal of the California Hydrogen Highway Network is to maximize the learning from hydrogen vehicle and refueling implementation over the next five years. A key question is: what can we learn by implementing hydrogen in a *regional network* of refueling stations, beyond what could be learned in individual demonstrations? Which key challenges can be addressed that currently block the hydrogen economy?

Implement statewide codes and standards for hydrogen refueling stations. The current lack of consistent codes and standards is a critical barrier to introduction of hydrogen as a fuel. By 2010, the state will implement codes and standards for important applications such as hydrogen dispensed in fleet operations, hydrogen dispensed at urban and highway gasoline refueling stations, and hydrogen energy stations. California should serve as a model for the United States, and the world. Collection of data on hydrogen safety and operating experiences should be a key activity for the California Hydrogen Highway Network. To accelerate learning in the entire field, the California Hydrogen Highway Network should coordinate with ongoing US DOE activities, some of which will likely be in California.

By 2010, Hydrogen safety standards, building codes, emergency response procedures, and training for key officials should be in place. Statewide permitting for hydrogen stations with rigorously established standards should be in place by 2010.

Implementation of early regional refueling networks (for example in the Los Angeles basin and/or in the San Francisco/Sacramento corridor): Develop networks of publicly accessible hydrogen fueling stations such that a vehicle traveling in inter- and intra-regional areas will have ready access to hydrogen fuel. For example, a hydrogen vehicle starting in San Francisco would be able to refuel at or enroute to Sacramento, or a vehicle starting in Santa Monica can travel to Palm Springs. These networks will demonstrate the viability of using hydrogen vehicles with a 200-300 mile range and quick refueling for a variety of uses. For statewide travel, a limited number of stations might be sited along interstates.

Building new fueling stations for particularly attractive technical options. Ensure that permitting for new stations or retrofitting of existing stations allows for introduction of new hydrogen production and refueling technologies.

Establish Societal benefits of hydrogen.

Environmental analysis: This should be carried out to illustrate the potential of hydrogen technologies for reducing environmental impacts of fuels use, stressing a tie-in with clean fuels and renewables.

Energy security/Resource issues: Hydrogen is produced in many ways, enabling diverse sources to be used for transportation fuels. Estimate the renewable and fossil-fuel resource base available in California for clean hydrogen production. Examine the role of natural gas as a near term transitional source of hydrogen.

Move hydrogen vehicle and stationary power technologies toward commercialization through enabling vehicle refueling and providing incentives for development of these technologies.

Build on California's lead in Hydrogen and Fuel Cell Technologies

The State government of California has a role as an early adopter of hydrogen technologies and policy trend-setter. When possible, State vehicle fleet should include an increasing number of clean, hydrogen powered vehicles to be purchased during the normal course of fleet replacement.

Provide appropriate incentives to encourage the development of hydrogen fueling infrastructure and the purchase of hydrogen-powered vehicles.

Provide appropriate incentives to encourage the development of renewable sources of energy for hydrogen production

Incubate new businesses and establish California's leadership in hydrogen and fuel cell technologies. Build on California's role as a leader in alternative energy technology and policy, and its outstanding research capabilities in its universities, industries and national laboratories.

Research and Education. California will lead the way towards a hydrogen economy by incorporating the increased research capabilities of its companies, universities and national laboratories.

Measurements of Success in 2010

Access – Access to hydrogen will be provided for users through a network of hydrogen stations built to serve public, fleets, private users, and stationary applications or energy stations.

Significant and Increasing Percentage of Renewable Hydrogen – (significant is defined as meeting or exceeding what is being done for electric sector with renewable portfolio standard). A significant fraction of hydrogen fuel generated for use as part of the California Hydrogen Highway Network will be produced from clean, renewable sources, including wind, solar, biomass, geothermal, and hydropower, and this percentage should be on an increasing trend.

Balance of Commercialization Pathways – Balance pathways of individual ownership, (i.e. early adopters) and fleet adoption (i.e., buses, shuttles, government vehicles, service vehicles, and forklifts). California's largest metro

areas should have fleet demonstrations of high visibility public vehicles and/or mass transit vehicles, maximizing public exposure and acceptance. *Individual early adopters should be a vocal, high-profile stakeholder group, actively engaged in further adoption of hydrogen technologies with the media, industry, and legislators.*

Public Education on Hydrogen – A survey of the California citizenry and an audit of media in 2010 should show a basic understanding of the rationale for and benefits of hydrogen as a transportation fuel and energy carrier.

Commercially Viable Hydrogen Vehicles & Hydrogen Powered Devices – Users should be able to purchase hydrogen technologies for transportation and stationary applications. A “business-case” for hydrogen should be evidenced by either profit, expectation of profit, and/or increased investment in the hydrogen business sector.

Hydrogen Codes, Standards, Emergency Response, Training – Codes, standards, emergency response procedures, and training programs will be in place as soon as technically and logistically feasible.

Research and Training—Research institutions and universities within the state will have implemented programs to ensure that California leads the country in hydrogen related research and education. Universities will have implemented undergraduate and graduate research and training programs such that scientists, engineers, business leaders and policy makers trained in California are some of the best in the world. There will be a high level of awareness among permitting officials to support hydrogen infrastructure implementation. One hundred percent of California’s emergency responders will have been trained in hydrogen safety.

Jobs and Business – California will have created the business environment such that innovative companies involved in the production, distribution, and utilization of hydrogen will have incentives to locate and hire from the state. California will have created new jobs and located new hydrogen related companies by 2010. This will create the necessary foundation for the future economic and employment growth of hydrogen industries in the state.

BEYOND 2010

The California Hydrogen Highway Network is the beginning of a transition toward widespread use of hydrogen. In the next five years, California could lead the way for the nation and the world